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ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

GREENE, DANIEL LAWSON

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 08/470,424
Filing Date: June 06, 1995
Appellant(s): YOKOMIZO ET AL.

Melvin Kraus
For Appellant

EXAMINER'S ANSWER

MAILED

NOV 16 2005

GROUP 3600

This is in response to the appeal brief filed 2/23/2004 appealing from the Office action mailed 2/26/2001.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The statement of related appeals contained in the brief is correct.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Appendix

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

(9) Related Proceedings Appendix

In accordance with the 5/13/2005 Petition Decision, see for example the 3rd page, last sentence of the 2nd full paragraph, the instant Appeal Brief has been deemed

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not to have to conform with current practices and as such, no Related Proceedings

Appendix has been received from Appellant.

(10) References of Record

3,910,818	SOFER	10-1975
61-256282	IZUTSU	5-1985
59-220686	NAKAMURA	5-1983
60-031090	NAKAMURA	7-1983
5,251,246	MATZNER	10-1993
3,528,885	KUMPF	5-1966

Definitions of "scram" and "shutdown", Terms in Nuclear Science and Technology, ASA N1.1-1957, National Academy of Sciences (1957), pp152 and 157.

Although not cited in any rejections, the Examiner has included the following two U.S. Patents to further support the Examiners position that those in the art are well aware of the differences between "renewing" nuclear fuel assemblies (Gorscak et al. column 1, lines 15-20) and "refueling" nuclear reactors (Dana et al. column 2, lines 25-34).

4,732,730	GORSCAK ET AL.	3-1988
3,208,912	DANA ET AL.	9-1965

(11) Grounds of Rejection

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The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the Appellant regards as his invention.

A. **Claims 24, 26, 29, 40-43, 50, 52, 53, 56-59, 61-63 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.** There is no support in the original disclosure (including page 15, line 33 to page 16, line 3 (see page 6 of the 3/27/00 response)) for the limitation of the definition of the fuel cycle in lines 12-17 of claim 24, lines 26-31 of claim 52, lines 9-14 of claim 56, lines 12-17 of claim 61, lines 26-31 of claim 62 and lines 9-14 of claim 63.

Appellant argues the definition of "one fuel cycle" including the precise metes and bounds of said definition including the definitions of "the fuel" and "renewing the fuel".

Note that Appellants claims incorrectly indicate that the "renewing" takes place while the fuel assembly is in the nuclear reactor.

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Appellant is improperly relying on the disclosure of U.S. patent 4,285,769 for support for the limitations in the claims (particularly the reference to renewing a portion of the fuel assemblies).

Appellant argues that 4,285,769 is referred to in the present specification on page 19 line 29. However, said page 19 does not incorporate by reference, the subject matter of 4,285,769.

B. Claims 24, 26, 29, 40-43, 50, 52, 53, 56-59, 61-63 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellant regards as the invention. The claims are vague, indefinite, incomplete, misdescriptive and inaccurate in indicating that the renewing of the fuel assembly takes place while the fuel assembly is still in the nuclear reactor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claims 24, 50, 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan 61256282 in view of Sofer.

The primary reference shows operating a nuclear reactor wherein the fuel assemblies have at least one water rod, in a manner such that the water rod has

a steam void therein during a first part of the fuel cycle, and, is completely filled with water during a second part of the fuel cycle by increasing the coolant flow rate. While the primary reference may accomplish this change in flow by changing the size of an opening in the water rod, it was also a known alternative in this art that this necessary change in flow rate could also be accomplished by changing the flow rate at which the coolant is recirculated in the reactor system (as shown for example by Sofer) and, to so modify the primary reference would accordingly have been prima facie obvious.

Note in this respect that Sofer also indicates it is advantageous to reduce the void fraction towards the end of the fuel cycle (the same as in any of the primary references).

The paragraph bridging pages 8 and 9 of the English language translation of Japan 61256282 clearly states that the fuel assembly remains in the core for several cycles and that recent boiling water atomic reactors are designed so that the fuel assembly is not moved by shuffling.

Appellant has improperly modified the primary reference Japan 61256282 in view of U.S. 4,285,769 and then taken the position that his claims do not read on his proposed modification of Japan 61256282 in view of U.S. 4,285,769.

However, it is immaterial as to whether or not the claims read on the teachings of Japan 61256282 in view of U.S. 4,285,769 because the examiner has never raised such as an issue.

Instead, the examiner has held Appellant's claims unpatentable over the teachings of Japan 61256282 in view of Sofer (U.S. 3,910,818).

Most importantly, Appellants are incorrect in stating that a "fuel cycle is an operating period of a nuclear reactor from starting of the reactor to shutdown of the nuclear reactor".

Appellants are also incorrect in stating that this statement regarding a fuel cycle, is described in their specification at page 15 line 34 to page 16 line 3.

Instead, said portion of the specification actually states that one fuel cycle, is the operation period of a nuclear reactor from when the fuel in the reactor core is replaced and operation of the reactor is started to when the nuclear reactor is stopped for renewing of the fuel.

Said page 15 line 33 to page 16 line 3 has been reproduced below for Appellant's convenience.

"This operation method applies for one fuel cycle (operation period of a nuclear reactor from when the fuel in the reactor core is replaced and operation of the nuclear reactor is started to when the nuclear reactor is stopped for renewing the fuel, i.e., usually, one year)". (underling added).

Clearly, a nuclear reactor can be shutdown for reasons other than for refueling. For example, the shutdown of a nuclear reactor due to reactor scram, is not referred to as a "fuel cycle". The paragraph spanning pages 9 and 10 of the English language translation of Japan 61256282 (and Figs. 5 and 6) clearly indicate that the flow through the water rod is adjusted (e.g. in the manner shown in Figs. 5 and 6) during periodic inspection (not reactor shutdown for replacing (renewing) fuel assemblies).

Note particularly that the English language translation of Shugotai clearly indicates that the amount of voids in the water rod is changed from a first half stage to a second half stage of the fuel combustion (i.e. during one fuel cycle) and, that the fuel assembly containing said water rod is not removed or extracted from the reactor core nor is it shuffled.

Note that the primary reference indicates that this changing of the amount of voids in the water rod during a fuel cycle advantageously allows one to take advantage of the spectral shift effect.

Note further, that the secondary reference of Sofer also teaches that changing the amount of voids in the reactor core during a fuel cycle allows one to take advantage of the spectral shift effect.

While the primary reference shows that the changing of the amount of voids during a fuel cycle, can be accomplished by changing the size of the inlet orifice to a water rod (and thus leaving the pump recirculation flow rate the same), the secondary reference of Sofer teaches that this changing of the amount of voids during a fuel cycle can be accomplished by appropriately increasing the recirculation rate of the pumps (e.g. see col. 2 lines 23-32).

Note that Sofer teaches that this manner of changing the amount of voids is especially simple and economical (col. 2 lines 16-20).

Accordingly, it is maintained that it would have been prima facie obvious to have modified the primary reference by producing the desired change in the amount of voids in the water rod during a fuel cycle, by the "especially simple and

economical" manner of changing the coolant flow reactor of the circulation pumps (as an alternative to the obviously more costly and laboriously manner of changing the amount of voids by changing the size of an orifice in the water rods).

As pointed out above, the primary reference teaches that the changing of the amount of voids should take place during the fuel cycle. Clearly, if the fuel assembly containing said water rod was removed, thus signaling the end of the fuel cycle, the plutonium produced in the fuel assembly (during the first period of operation with a large amount of voids) would not be burned up in the latter part of the fuel cycle when there are less voids present (the reactor would thus not be taking advantage of the spectral shift effect).

However, even if the primary reference did not teach that one should change the amount of voids in the water rod during a fuel cycle (so as to take advantage of the spectral shift effect), it would have been obvious in any event to have modified the primary reference by changing the amount of voids during the fuel cycle, in view of the express teachings in Sofer that it is advantageous to change the amount of voids during the fuel cycle by changing the recirculation coolant flow rate, so as to be able to take advantage of the spectral shift effect in an especially simple and economical manner (e.g. in Sofer see the Abstract, col. 2, lines 10-32, col. 5, lines 48+, col. 6).

As pointed out by Appellant in the 1/11/99 response spanning pages 8 and 9, changing the flow rate of a pump inherently and obviously involves changing the number of revolutions of the pump.

It is further noted that the issue is not what was known by the artisan or would have been obvious to the artisan, at the time of filing of the Sofer patent, but rather, what would have been obvious to the artisan as of the time of filing of the present case (at which time it was conventional for boiling water reactors to utilize fuel assemblies containing water rods).

B. Claims 24, 50, 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Japan 0220686 or Japan 0031090 in view of Sofer alone or with Japan 61256282.

The primary references show operating a nuclear reactor wherein the fuel assemblies have at least one water rod, in a manner such that the water rod has a steam void therein during a first part of the fuel cycle, and, is completely filled with water during a second part of the fuel cycle by increasing the coolant flow rate. While the primary references may accomplish this change in flow by changing the size of an opening in the water rod, it was also a known alternative in this art that this necessary change in flow rate could also be accomplished by changing the flow rate at which the coolant is recirculated in the reactor system (as shown for example by Sofer) and, to so modify any of the primary references would accordingly have been prima facie obvious.

Note in this respect that Sofer also indicates it is advantageous to reduce the void fraction towards the end of the fuel cycle (the same as in any of the primary references).

Appellants are incorrect in stating that a "fuel cycle is an operating period of a nuclear reactor from starting of the reactor to shutdown of the nuclear reactor".

Appellants are also incorrect in stating that this statement regarding a fuel cycle, is described in their specification at page 15, line 34 to page 16, line 3.

Instead, said portion of the specification actually states that one fuel cycle, is the operation period of a nuclear reactor from when the fuel in the reactor core is replaced and operation of the reactor is started to when the nuclear reactor is stopped for renewing of the fuel.

Said page 15, line 33 to page 16, line 3 has been reproduced below for Appellant's convenience.

"This operation method applies for one fuel cycle (operation period of a nuclear reactor from when the fuel in the reactor core is replaced and operation of the nuclear reactor is started to when the nuclear reactor is stopped for renewing the fuel, i.e., usually, one year)". (underling added).

Clearly, a nuclear reactor can be shutdown for reasons other than for refueling.

For example, the shutdown of a nuclear reactor due to reactor scram, is not referred to as a "fuel cycle".

The feature of changing the amount of voids in a water rod during a fuel cycle, without removing the fuel assembly from the core is referred to in either of the two primary references.

For example, the English language translation of Japan 0031090 refers to changing the amount of voids in the water rod without removing the fuel assembly from the core and, that this changing of the amount of voids takes place after a first period of operation with a high amount of voids in the water rod (the water rod being filled with water (zero voids) during the subsequent period of operation.

This same teaching is also found in the other primary reference of Japan 0220686.

Note that both of the primary references indicates that this changing of the amount of voids in the water rod during a fuel cycle advantageously allows one to take advantage of the spectral shift effect.

Note further, that the secondary reference of Sofer also teaches that changing the amount of voids in the reactor core during a fuel cycle allows one to take advantage of the spectral shift effect.

While both primary references show that the changing of the amount of voids during a fuel cycle, can be accomplished by changing the size of the inlet orifice to a water rod (and thus leaving the pump recirculation flow rate the same), the secondary reference of Sofer teaches that this changing of the

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amount of voids during a fuel cycle can be accomplished by appropriately increasing the recirculation rate of the pumps (e.g. see col. 2 lines 23-32).

Note that Sofer teaches that this manner of changing the amount of voids is especially simple and economical (col. 2 lines 16-20).

Accordingly, it is maintained that it would have been prima facie obvious to have modified either of the primary references by producing the desired change in the amount of voids in the water rod during a fuel cycle, by the "especially simple and economical" manner of changing the coolant flow reactor of the circulation pumps (as an alternative to the obviously more costly and laboriously manner of changing the amount of voids by changing the size of an orifice in the water rods).

As pointed out above, both primary references teach that the changing of the amount of voids should take place during the fuel cycle. Clearly, if the fuel assembly containing said water rod was removed, thus signaling the end of the fuel cycle, the plutonium produced in the fuel assembly (during the first period of operation with a large amount of voids) would not be burned up in the latter part of the fuel cycle when there are less voids present (the reactor would thus not be taking advantage of the spectral shift effect).

However, even if both primary references did not teach that one should change the amount of voids in the water rod during a fuel cycle (so as to take advantage of the spectral shift effect), it would have been obvious in any event to have modified the primary reference by changing the amount of voids during the

fuel cycle, in view of the express teachings in Sofer that it is advantageous to change the amount of voids during the fuel cycle by changing the recirculation coolant flow rate, so as to be able to take advantage of the spectral shift effect in an especially simple and economical manner (e.g. in Sofer see the Abstract, col 2, lines 10-32, col. 5, lines 48+, col. 6).

As pointed out by Appellant in the 1/11/99 response spanning pages 8 and 9, changing the flow rate of a pump inherently and obviously involves changing the number of revolutions of the pump.

It is further noted that the issue is not what was known by the artisan or would have been obvious to the artisan, at the time of filing of the Sofer patent, but rather, what would have been obvious to the artisan as of the time of filing of the present case (at which time it was conventional for boiling water reactors to utilize fuel assemblies containing water rods).

It is again pointed out that the primary references each clearly teach that the screen only is removed for the third and subsequent portions of the fuel cycle (not that the fuel assembly itself is removed).

In any event, if necessary, Japan 61256282 may be relied in for a showing that it is old in the art and hence obvious, to leave the fuel assembly in the core and merely change the amount of flow there through between a first and second part of a fuel cycle, without replacing or even shuffling the fuel assembly.

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C. Claims 24, 26, 29, 40-43, 50, 52-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matzner in view of Sofer taken with Japan 61256282.

Matzner shows a fuel assembly having a plurality of fuel rods R (which inherently contain fuel pellets) held between upper and lower tie plates (U, L), spacers and at least one water rod W (e.g. see Fig. 1 and col. 1, 2, 3).

The water rod W has a coolant inlet 14 open in a region below the lower tie plate L. Water rod W has a coolant ascending path inside conduit 14 (which become standpipe 15) and, a coolant descending path in the annulus between pipes 15 and 18 with coolant delivery ports 20. The lower tie plate of Matzner will function as a "resistance member".

The claims refer to controlling amounts of voids in the water rods. As indicated even by Appellant's own specification, the formation of voids in the water rods is dependent on the amount or rate of coolant flow produced by the circulation pump. Matzner refers to flowing coolant through the core by means of "conventional circulating pumps" (col. 3, lines 64+). Such pumps are inherently capable of operation at different flow rates. Thus, the use of a circulation pump which can operate at different flow rates and consequently produce different amounts of voids in the water rods is considered inherent in the teachings of Matzner.

The claims refer to this manner of controlling the amounts of voids in the water rods as operating the water rods with steam voids therein during a first part of the fuel cycle and, operating such that the water rods are completely filled with

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water during a second part of the fuel cycle. Such however, is already, shown to be old and advantageous in the art by Japan 61256282 and to so modify Matzner would accordingly have been prima facie obvious. While the Japanese reference accomplishes the desired change in flow by changing the size of an opening in the water rod, it was also a known alternative in this art that this necessary change in flow rate could also be accomplished by changing the flow rate at which the coolant is recirculated in the reactor system (as shown for example by Sofer) and, to so modify the primary reference would accordingly have been prima facie obvious.

Note in this respect that Sofer also indicates it is advantageous to reduce the void fraction towards the end of the fuel cycle (the same as in each of the Japanese reference).

Note that claims such as claim 53 merely set forth conventionally known and utilized flow rate percentages, the use of which would accordingly have been prima facie obvious.

Note that Sofer (as well as the Japanese reference) provide the express teaching that it is advantageous in the boiling water reactor art (to which the primary reference of Matzner et al is directed) to operate the reactor such that there is a greater amount of voids present during a first period of the fuel cycle so as to enhance the production of fissile plutonium, with this produced plutonium being burned in a latter part of the fuel cycle wherein the reactor is operated with a decreased amount of voids (which produces a softer neutron spectrum).

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D. Claims 24, 26, 29, 40-43, 50, 52-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matzner in view of Sofer and with Japan 61256282 as applied to claims 24, 26, 29, 40-43, 50, 52-63 above, and further in view of Appellants own admission of prior art in the specification (e.g. see specification as filed page 25).

The use of the claimed flow rate percentages (e.g. see claim 53), in the primary reference would have been prima facie obvious in view of the teachings thereof in the admitted prior art in the specification in, for example, page 25, lines 20-25.

E. Claims 24, 26, 29, 40-43, 50, 52-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan 61256282 in view of Sofer as applied to claims 24, 50, 61 above, and further in view of any of Matzner, or Kumpf.

Claims such as claim 26 refer to the water rod as having a coolant ascending path with a coolant inlet port open in a region lower than the lower tie plate and a coolant descending path which has a coolant delivery port that is open in a region higher than the lower tie plate (the claimed resistance member).

However, such is a conventionally known and advantageous water rod configuration as shown by either of Matzner or Kumpf and, to utilize this water rod configuration in any of the primary references would accordingly have been prima facie obvious.

F. Claims 24, 26, 29, 40-43, 50, 52-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Japan 0220686 or Japan 0031090, in view of Sofer alone or with Japan 61256282, as applied to claims 24, 50, 61 above, and further in view of Matzner, or Kumpf.

Claims such as claim 26 refer to the water rod as having a coolant ascending path with a coolant inlet port open in a region lower than the lower tie plate and a coolant descending path which has a coolant delivery port that is open in a region higher than the lower tie plate (the claimed resistance member).

However, such is a conventionally known and advantageous water rod configuration as shown by either of Matzner or Kumpf and, to utilize this water rod configuration in any of the primary references would accordingly have been prima facie obvious.

(12) Response to Argument

I. The rejections under 35 U.S.C. 112

(A) 35 U.S.C. 112, first paragraph, NEW MATTER

Appellant argues that the specification contains the definitions of "one fuel cycle", "the fuel" and "renewing the fuel" including the precise metes and bounds of said definitions and as such the definition of one fuel cycle is not new matter.

AGAIN, it must be noted that Appellant is improperly relying on the disclosure of U.S. patent 4,285,769 for support for the limitations in the claims (particularly the reference to renewing a portion of the fuel assemblies).

Appellant argues that 4,285,769 is referred to in the present specification on page 19 line 29. However, said page 19 does not incorporate by reference, the subject matter of 4,285,769.

The specification as filed, page 15, line 35 and page 16, lines 1-3 refers to "the fuel" in the reactor core being replaced, not to the fuel assemblies. On page 15 of the Appeal Brief received 2/23/2004, Appellant argues it is known that fuel is contained in the fuel assemblies and therefore only the fuel is replaced, NOT the fuel assembly.

Further, it is noted that the 1/27/2000 amendment to the claims introduced the limitation "at least one" meaning only one of the fuel assemblies need be "renewed" in a fuel cycle.

However the specification makes no reference to this minimum number of one fuel assembly to be "renewed" in a fuel cycle. (Note that the quoted portion of U.S. 4,285,769 on page 10 of the brief refers to typically one fourth (1/4) of the fuel assemblies being replaced, NOT a minimum of one fuel assembly as in the amendment to, for example, claim 24 that was held as new matter)(also U.S.

4,285,769 uses the term "replaced" not "renewed" (which was pointed out to Appellant on page 3 of the 2/25/2001 Office action.))

"Appellant is improperly relying on the disclosure of U.S. patent 4,285,769 for support for the limitations in the claims (particularly the reference to renewing a portion of the fuel assemblies)." (Underlining added)

Neither Appellant's specification nor U.S. 4,285,769 defines the term "renewed" (the Examiner has the word "renewed" in quotation marks on page 2 of the 2/25/2001 Office action). One might argue that the term "renewed" should mean the same as "replaced" however, Appellant at the top of page 16 of the brief states the manner of renewal is obtained by changing the fuel in the fuel assembly (which definition is NOT in the specification)(and more importantly, this definition in the brief refers to changing the fuel itself of the fuel assembly, not to replacing the fuel assembly.)

Note that at the end of a fuel cycle, all of the fuel assemblies can be replaced rather than just one quarter (1/4) of them as in 4,285,769 and as in the amendment to the claims held to be new matter.

The way the sentence bridging pages 15 and 16 of the specification reads, (i.e. the fuel in the core is replaced, renewing the fuel) would indicate that all of the fuel is renewed not just one fuel assembly as in claim 24 and not just a portion of the fuel assemblies as in claim 61(thus the reference to less than all of the fuel being renewed is new matter).

Regarding claims 54, 55 and 60 it is noted that claim 55 is NOT under appeal and claims 54 and 60 do NOT contain the limitations in question.

(B) 35 U.S.C. 112, second paragraph, INDEFINITNESS

The 11/7/2000 amendment amended the 3/27/2000 amendment (which had already been held as new matter as explained above) by adding the phrase "in the nuclear reactor" so that the last portion of the 3/27/2000 amendment read, "renewing at least one of the fuel assemblies in the nuclear reactor"

The Examiner held this addition to be new matter AND applied a 35 U.S.C. 112, 2nd paragraph rejection stating it indicated the "renewing" takes place while the fuel assembly is still in the nuclear reactor core.

Regarding claims 54, 55 and 60 it is noted that claim 55 is NOT under appeal and claims 54 and 60 do NOT contain the limitations in question.

II. The rejections under 35 U.S.C. 103

Regarding Appellant's citation of the Boards prior decision, it must be noted that the Patterson reference is NOT being applied in ANY of the instant rejections. It is also imperative to note that the instant application is directed toward a METHOD of operating a nuclear reactor NOT the structure of the related application (now U.S. Patent 6,278,757), per se.

In this regard it must also be noted that the actual structure that defined over *the* art in said related application is NOT claimed in the instant application.

(A) The rejection utilizing Japan 61256282 and Sofer

Appellant has improperly modified the primary reference Japan 61256282 in view of U.S. 4,285,769 and then taken the position that his claims do not read on his proposed modification of Japan 61256282 in view of U.S. 4,285,769.

However, it is immaterial as to whether or not the claims read on the teachings of Japan 61256282 in view of U.S. 4,285,769 because the examiner has never raised such as an issue.

Instead, the examiner has held Appellant's claims unpatentable over the teachings of Japan 61256282 in view of Sofer (U.S. 3,910-818).

Japan 61256282 clearly indicates that the fuel assembly remains in the reactor core for a whole or complete combustion cycle (fuel cycle) without shuffling.

Page 9 of the English language translation of Japan 61256282 (and Figs. 5 and 6) clearly indicate that the flow through the water rod is adjusted (e.g. in the manner shown in Figs. 5 and 6) during periodic inspection (not reactor shutdown for replacing (renewing) fuel assemblies).

Appellant's argument in the first paragraph on page 24 of the brief is immaterial because the rejection is not on Japan 61256282 by itself.

Appellant's argument that Sofer does not teach the rise of the coolant surface formed in a water rod, is also immaterial because the examiner has not relied on Sofer for a teaching of such.

As pointed out in section 3 of the 8/25/99 Office action, both Japan 61256282 and Sofer teach it is advantageous to change the amount of voids in the reactor core during a fuel cycle (combustion cycle) so as to take advantage of the spectral shift effect.

Accordingly, it is maintained that it would have been prima facie obvious to have modified Japan 61256282 by producing the desired change in the amount of voids in the water rod during a fuel cycle, by the teachings in Sofer of an "especially simple and economical" manner of changing the coolant flow rate of the circulation pumps (as an alternative to the obviously more costly and laboriously manner of changing the amount of voids in the manner shown in Figs. 5 and 9 and described on page 9 of the English language translation of Japan 61256282).

Regarding the second paragraph on page 24 of Appellant's brief that Sofer and Japan 61256282 fail to disclose or teach "the complete filling of the water rod by the coolant in each fuel cycle" it is noted that the claims do not contain such a limitation. The claims only disclose this limitation during the "another" period, not "each fuel cycle"

In response to Appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

(B) The utilization of Japan 0220686 or Japan 0031090 with Sofer and/or Japan 61256282

It is noted that the rejection is based on Sofer alone OR with Japan 61256282, not Sofer and/or Japan 61256282.

In response to Appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Regarding the second paragraph on page 26 of Appellant's brief that the references fail to disclose or teach "the complete filling of the water rod by the coolant in each fuel cycle" it is noted that the claims do not contain such a limitation. The claims only disclose this limitation during the "another" period, not "each fuel cycle"

In response to Appellant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941

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(Fed. Cir. 1992). In this case, regarding Appellant's allegation that the teachings of the documents are inconsistent with each other, it is noted that it is only necessary to show that those in the art are well aware the teachings exist.

(C) Claims 24, 26, 29, 40-43, 50, 52-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matzner in view of Sofer taken with Japan 61256282.

Appellant is again arguing against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Note the discussion of Appellant's arguments in section II (A) above.

Appellant's arguments have not shown that the references do not teach what the examiner has stated they teach, nor has Appellant shown that the examiner's reasoning for and manner of combining the teachings of the references is improper or invalid.

(D) Claims 24, 26, 29, 40-43, 50, 52-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matzner in view of Sofer and with Japan 61256282 as applied to claims 24, 26, 29, 40-43, 50, 52-63 above, and further in view of Appellants own admission of prior art in the specification (e.g. see specification as filed page 25).

Again, Appellant is arguing against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellant's arguments have not shown that the references do not teach what the examiner has stated they teach, nor has Appellant shown that the examiner's reasoning for and manner of combining the teachings of the references is improper or invalid.

(E) Claims 24, 26, 29, 40-43, 50, 52-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan 61256282 in view of Sofer as applied to claims 24, 50, 61 above, and further in view of any of Matzner, or Kumpf.

Again, Appellant is arguing against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellant's arguments have not shown that the references do not teach what the examiner has stated they teach, nor has Appellant shown that the examiner's reasoning for and manner of combining the teachings of the references is improper or invalid.

(F) Claims 24, 26, 29, 40-43, 50, 52-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Japan 0220686 or Japan 0031090, in view of Sofer alone or with Japan 61256282, as applied to claims 24, 50, 61 above, and further in view of Matzner, or Kumpf.

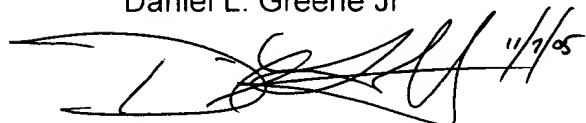
Again, Appellant is arguing against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellant's arguments have not shown that the references do not teach what the examiner has stated they teach, nor has Appellant shown that the examiner's reasoning for and manner of combining the teachings of the references is improper or invalid.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Daniel L. Greene Jr



Conferees: Ricardo Palabrica



Jack Keith (SPE 3663)



JACK KEITH
SUPERVISORY PATENT EXAMINER